

UNIVERSITY OF CALIFORNIA
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION

CIRCULAR No. 221

AUGUST, 1920

**HOW CALIFORNIA IS HELPING PEOPLE OWN FARMS
AND RURAL HOMES**

By ELWOOD MEAD

FOREWORD

In 1899 Edward F. Adams, writing about California agriculture, expressed the opinion that "the present generation has the means to produce comfortable sustenance for all."¹ No one questioned the truth of this statement when it was written, but in 1920 all agricultural journals point out that this nation is faced with a shortage of food and how to obtain three square meals a day is becoming a vital problem.

The main reasons for this are the high wages and easy conditions of labor in cities and the obstacles which high land prices and high rents present to men who seek to become farm owners. When Henry Ford made \$5.00 a day the minimum wage of unskilled workers in his factory, he started a competition for labor that the farmer could not meet. The results in Michigan are seen in 19,000 idle farms and 10,000 empty farm houses.

No more important problem confronts this country than that of bringing this lost labor back to the land. California is seeking to secure this result by helping tenant farmers become owners and creating a more attractive rural life for all who live there.

From five to fifty letters of inquiry, about the State Land Settlement Act, come each day to the board's office at the State University. Most of these inquiries come from people who want to buy farms. Others come from people interested in rural progress. They seek to know why this act was passed and what have been the results of its operation.

The Land Settlement Board has no funds to use for educational purposes or extension work and answering these letters adequately costs something. It is one of the board's problems. Its business is to buy, subdivide and sell land to actual settlers at cost. Every dollar

¹ The Modern Farmer, p. 22.

provided by the state has to be returned within 50 years with 4% interest. The people who buy farms have to pay all the bills the board incurs.

It is highly important, however, that a knowledge of the social and economic benefits of the policy which this act embodies be widely diffused. State aid in California, although scarcely begun, is broadening the road to farm ownership and has lessened tenantry. It enables families to live in better houses, use better implements, own better livestock, and have a more attractive social life. Through it, a new and better rural civilization is being created.

The College of Agriculture, through this publication, shows how these results have been attained and why this policy is needed to round out and complete the state's training in agriculture, to keep Americans on the land and to help lessen the cost of food.

WHY AID IN LAND SETTLEMENT IS A STATE POLICY

1. HELPING LANDLESS MEN OWN FARMS GIVES ADDED POLITICAL AND SOCIAL STRENGTH TO THE STATE

Until about the end of the nineteenth century free or very cheap land was the economic foundation of this nation's democracy. "A free homestead of 160 acres," said Frederick Howe, "was a mirage of hope. It was the voice of opportunity calling to the pioneer."² It formed one of the strongest political ties binding widely separated peoples together. It influenced the scale of wages for all workers. Men who did not feel content as wage earners became their own employers on a homestead. It fostered the hopeful, confident, and independent spirit of the people.

When the free fertile land was taken up, farms began to rise rapidly in price. Twenty years ago good irrigated or irrigable land could be bought in the Sacramento and Imperial Valleys for from \$20 to \$50 an acre. That same land now sells for from \$100 to \$500 an acre. The money which would have bought a farm twenty years ago is now absorbed in the first payment.

The cost of farm improvements has risen with land prices. To prepare land for alfalfa costs more than double what it did five years ago. To plant and bring an acre of fruit or vines to the bearing age requires an outlay of money that no one would have risked a quarter of a century ago. A water right often costs more than the former price of both land and water.

² Privilege and Democracy, p. 15.

So long as homesteads were free, capital to buy a farm was not needed. Many of the last generation of farmers started with nothing and because of this there grew up a mistaken idea that lack of money was not a serious obstacle to buying a farm. This delusion has about run its course; both land buyers and land sellers are now wiser. In the latest land subdivisions of California, from one-fourth to one-half

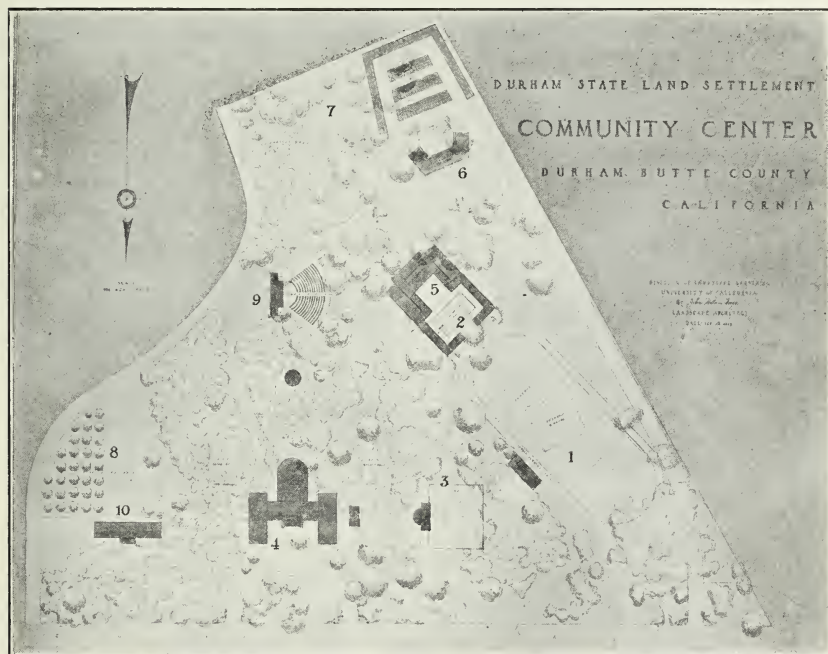


Fig. 1.—The Community Center, Durham. (1) Field sports; (2) swimming pool; (3) tennis courts; (4) school; (5) community hall; (6) stock show building and sheds; (7) automobile camping grounds; (8) experimental gardens; (9) open-air auditorium; (10) greenhouses.

of the purchase price has to be paid in cash. This is sound, safe business. It protects both farm buyer and land owner.³

³ The rapid rise in the price of farm lands in the middle west, which has taken place in recent years, is causing many farmers to sell and look for homes in California. They have ample capital, are good farmers, and bring to the state a new and valuable factor in its rural progress. The prices being paid for farms, and the initial payments made, show that agriculture is becoming a capitalized industry. Purchases aggregating a quarter of a million dollars and cash payments of fifty thousand dollars are not uncommon.

Eighteen farms advertised for sale in a San Francisco paper of June 27 varied in area from 45 to 1059 acres. Their cost varied from \$15,000 to \$343,000 and the first payments from \$3225 to \$79,500. To these costs there has to be added the outlay for improvements and equipment. In every case the cost of equipment will run into thousands of dollars, for these high priced lands must be well cultivated to pay.

Something more than this is needed. The landless poor man and the tenant farmer must be given a chance to own farms if we are to keep the right kind of boys and girls on the land. Something is needed which will do for economic democracy what was formerly achieved by the free homestead. Free land is not possible, but a generous system of credit and organized community life with coöperation as a cornerstone and with practical advice and encouragement for those who need it, will provide all the opportunity needed for those willing to work and save. Under such a plan young men and women who have a little capital can start life on farms of their own and have a life-time in which to pay for them. It will rescue the tenant farmer from having to spend his life farming the land someone else owns. Such a credit system makes the time of paying for a farm long enough to permit the money being earned out of crops. Settlers can go ahead with improvements because the tenure is secure and the small payments are no more burdensome than rent would be. If, with this credit, there is created an organized community life, it will mean a higher rural civilization than can come from unplanned development. Such state aid is now provided in many civilized countries. It is the basis of rural development in Australia and New Zealand and is the most valuable agrarian reform of recent times in Holland, Denmark, Germany, France and Great Britain. In all these countries this aid has averted a complete agricultural breakdown.

At first, the laws of these countries differed quite widely in details. Now they are much alike. All agree in giving from 40 to 80 years' time in which to complete paying for farms. In all, the interest rate is low, varying from $2\frac{1}{2}\%$ to 5%. In nearly all, the aim is to buy enough land to create an organized community of 100 or more families.

Some adequate system of advice and credit is needed to enable worthy landless people with little money to become farm owners, and, in this way, avert the growing dangers and evils of tenantry. From being a nation of farm owners, we are rapidly becoming a nation of tenant cultivators. Half of the land in some of the richest agricultural states is now farmed by tenants. As a rule, the leases are short, most of the tenants remaining only one or two years on a single farm. In this, and in other particulars, the conditions of these tenants are worse than they are in European countries because law and custom has not thrown the safeguards around tenantry in the United States that they have where it is an older institution.

But in these older countries, the peasant farmer has revolted against tenantry. He insists on ownership or a tenure equivalent to

ownership. In order to allay this unrest and hold people on the land, Great Britain has spent over \$500,000,000 in helping the Irish peasant to become a farm owner. Germany spent \$400,000,000 between 1906 and 1914 in helping men become farm owners. In 1900, about 90% of the land of Denmark was farmed by discouraged tenants. In 1920, 90% of it is farmed by enthusiastic and patriotic owners. The Credit Foncier made France a nation of farm owners. The Land Purchase Act of Ireland has put owners on nine million acres of land.

2. IT HELPS TO BRING BADLY FARMED LANDS UNDER INTENSE CULTURE AND
LESSENS THE COST OF LIVING

California has great areas of thinly peopled land⁴ used only for grain growing or pasture. If irrigated and seeded to alfalfa or planted to trees or vines, it would support a dense population. The greatest need of California is to have these great estates cut up into small farms each one cultivated by an intelligent American family. An ample home grown food supply is an economic need for the rapidly growing cities and a strong patriotic rural population a political need of the state which is the frontier of the white man's world. The first state settlement put fifty families where one lived before. The second will put 400 home owners where one lived when the land was purchased.

3. THE PLANNED RURAL COMMUNITY HAS A BETTER SOCIAL AND ECONOMIC LIFE
THAN THE UNPLANNED ONE

The rural community of the future will be organized. The people who live in it will coöperate in buying and selling and in doing many things that foster their general welfare. A rural neighborhood where every man looks out for himself, where there is no team work and where selfishness and sharp practices abound, has little to attract the kind of people rural society needs. Such neighborhoods are all too common where men of widely separated nations and racial habits are thrown together as they are in many parts of California.

Coöperation is a fundamental fact in the California State Settlements. No one was placed upon a farm in the Durham Settlement who did not want to become a member of the Stock Breeders' Association. Only those who desire to become members of the Coöperative Association will be approved as settlers at Delhi. Such action is needed in California if anything like neighborhood unity is to be secured. How far we are from it now is shown by the reports of the

⁴ In Kern County, four companies own over one million acres. The heirs of Henry Miller own 800,000 acres and in 1916, 310 land owners owned over four million acres of agricultural land in the state.

State Immigration and Housing Commission. Every citizen of the state ought to read the reports of its surveys and there ought to be more of such reports. Here is one example of how Los Angeles County is being Americanized. "This district has two isolated foreign colonies. In one, live Mexicans who own their own homes, but who live very much to themselves; where no English is heard except in the schoolroom. In the other section, down in the hollow, live 100 or so Russian Molokans where, because of religious convictions, it is difficult to penetrate."⁵

Fresno County is one of the oldest and best farming sections of the state but even there little progress has been made in bringing different nationalities to work and act together. The Housing Commission found that "in two schools, in more than 90 per cent of the homes, a foreign language is spoken. Fifty per cent of the families in five schools do not use English."⁶

Left alone as these people have been, they retain the anti-social traits they brought from other countries. "Barriers of speech, education, and religious faith split the people into unsympathetic, even hostile camps. The worst element in the community makes use of the ignorance and venality of the foreign-born voters to exclude the better citizens from any share in the control of local affairs. In this babel no newspaper becomes strong enough to mold and lead public opinion."⁷ To achieve success, they adopt methods foreign to American ideals and character and this stirs up strife and racial antagonisms.

The contrast between these conditions and the social fabric created or being created at Durham is most instructive. People who did not want to coöperate stayed away from the settlement. The families who are there soon lost their racial aloofness in the conferences of the Stock Breeders' Association, in the coöperative buying of cows and pigs, in the sale of all the milk of the settlers under a community label, in the effort to stamp out and keep out disease. These community activities made the settlers forget that they were of Irish, German, French, Scotch, Danish, Norwegian, English, Italian, Chilean or American ancestry. It has done even better service in breaking up the caste layer that in too many neighborhoods separates the farm owner from the farm worker. Families of farm laborers and farmers mingle in the community dances. Their children ride to school in the same bus. They all help plan and take part in the social activities at the community park. This mingling with his fellowmen has made

⁵ A Community Survey, p. 14.

⁶ Fresno's Immigration Problems, p. 14.

⁷ The Old World in the New, E. A. Ross, p. 229.



Fig. 2.—Clearing a farm laborer's block.



Fig. 3.—Block when cleared.

a good American out of Domingo Galves, a Chilean, who before that had drifted over the country with no social ties or political ideals. He, along with all the settlers, loves California for its interest in their daily life, for what it has done for them. It is bringing back the economic democracy which went with free land. University graduates own farm laborers' blocks in both settlements. They do all kinds of farm work. They are the best answers to the often made but mistaken statement that Americans will no longer do hard work. They and their families will do farm work if it does not involve implied social inferiority.

Prof. Ross in "The Old World in the New" calls attention to the fact that Americans had been driven out of many farm industries in California through farm owners bringing into the country people of a lower standard of living and of lower moral tone. Good people were driven out by cheaper people just as bad money drives out good money. If this policy of securing farm help wherever it can be had is to continue, then we must have some organized effort to lift these people up to American standards of life and of living and to endeavor to instill in them some of the ideals that have made this country what it is. From the landing of the first settlers at Plymouth Rock and in Virginia, the people who made this country were noted for their fortitude, their coolness in danger, their orderly habits of life, consideration for the weak and interest in government. They were people whose morals and standards of living made their children men and women of strength and beauty. The good looks of the descendants of American pioneers of Massachusetts, Virginia, Kentucky and California had their origin in both ancestry and right living.

So long as there was free land, rural America was largely made up of this fine type of people. The first immigrants from Great Britain and France were followed by other waves of immigrants from the Scandinavian countries, Germany and Ireland. They were being fused into a harmonious rural society when free land disappeared and a new type of immigrant appeared. What these are in California is shown by a recent report of the Immigration and Housing Commission which gives the following racial summary of the farm laborers of California: "Albanians, East Indians, Filipinos, Greeks, Spaniards, Slavonians, Poles, Russians, Syrians, Mexicans, Maltese, Japanese, Chinese, Portuguese, Armenians, Italians, a few Scotchmen and Germans, and here and there an American. Of these, 60 per cent are migratory and 40 per cent are local, with jobs averaging from 10 to 15 days in length." These people are separated by language from each other and from the past ideals and standards of American rural

life. They need something like the organized community activities of Durham to break down the barriers of religion, customs, racial habits and language. At present, there is also a lack of family life because we have had no provision for homes for farm laborers. As the men greatly outnumber the women, they live in bunk houses and have no social status or interest in community progress. These conditions must be changed if the future of American rural civilization is to equal its past. If some of these backward, emotional, unstable peoples are left to herd alone, they will not be lifted up to American standards, but the standards of poorer countries will be established here.

There are many who believe that the public school will alone transform what would otherwise be country slums; that we can ignore the way families live in their homes if we look after the education of the children. The reports of the State Immigration and Housing Commission show that this is a cheerful delusion. Where the people of one race flock together, the schools do not have a fair chance. Many of their churches oppose the public schools. They tell the children this is the road to hell. They have their own newspapers and in effect create little Balkan states and little Japans in the part of California that ought to be purely American.

If we import people from countries where the conditions of life are hard in order to get cheap farm labor, its evils will not touch the wealthy or the well to do. If there was an immigration which would compete with our people in banking, commerce and the professions as those who come from the submerged countries of eastern Europe or Asia now compete with those who work in factories or on the farm, there would be a protest from those who now advocate this policy. As it is now, the cleanliness, the education and the moral standards which we have slowly built up in this country act like a poison when the people who hold them are forced to compete with others who have the standards of living of the middle ages.

Asiatics displace Americans by paying higher prices for land and higher rents for farms than white farmers are able or willing to pay. They do this because they have been trained in an economic competition that is the despair of the individualistic and generous American. Their hours of labor, cheapness of living and racial team work are advantages which have enabled them to displace the American wherever they seriously undertake it. Owners of land who are more interested in what they can make out of it than in protecting the racial integrity of the country, rent or sell to whoever pays the

highest price and in this way social and economic conditions of untold seriousness are being created.

The time has come when we must give more attention to the contribution which rural life makes to human society. Whether we have good government or bad government depends quite largely on public opinion and to have an intelligent public opinion in the country, farmers must have time to read, think, meet together and discuss public affairs. They cannot do this if they have to compete with the men who are able to pay high prices for land or high rents for farms because of their low standards of living. Under such competition the time and strength of the American family must be given up to the hard task of making a living.

Governor Stephens has called the attention of the Federal Government to the need for a law which will preserve the American standards of rural life on the Pacific Coast. This cannot be done if we open wide the doors to the 800,000,000 of Orientals who are moved by an unrest and migratory impulse never before known in history, or if we bring here any large part of the 150,000,000 now struggling to escape from the chaotic conditions of Russia or Eastern Europe.

As this country has drawn more and more from countries with lower standards of living, it has become less and less attractive to the intelligent and progressive immigrants from northern Europe. It crowds out the Danish, Welsh, French and German just as it crowds out the American. There is no question that it is creating social slums in the country districts of California, that it is not only holding back social progress, but it menaces both the social and political future of the state. But, if we are to maintain high social and economic ideals on the farm, if the American family is to be able to clothe and educate their children, then there must be in this country as there has been in the countries of western Europe and Australia, constructive action by the government which will open to American farmers and farm workers the opportunities for land and farm ownership formerly afforded by free land. This cannot be left to private enterprise because the incentive to the action is social and political and not to make money. The reasons that led Australia to advance hundreds of millions of dollars to building up a sound rural civilization and keep out the swarming tides of Orientals that sought to come in, must sooner or later constrain California and other American states to adopt the policies of the California Land Settlement Act.

HOW LAND FOR SETTLEMENT IS ACQUIRED

Land for two settlements has been bought. In each case the Board invited offers of land in areas large enough to provide not less than 100 farms. Four thousand acres was the minimum area which would be considered. About 40 different tracts were offered at the time of the first purchase and about 80 tracts at the time of the second.

The soil of the different tracts was examined by Prof. C. F. Shaw, Professor of Soil Technology at the University of California, and his assistants. His reports have greatly aided the Board. The Dean of the College of Agriculture is the expert adviser regarding the suit-



Fig. 4.—Farm home, Durham.

ability of land to be purchased and the price which ought to be paid. Prof. Frank Adams, in charge of irrigation investigations, has advised the Board regarding water rights and suitability of soil for irrigation. Prof. W. B. Herms has reported on health conditions.

Both of the tracts purchased are irrigable. The irrigation canals at Durham are completed and are being operated by the settlers' association. The distributing system at Delhi will be completed for the first and second units in time for irrigation in 1921. A contour and soil survey of both tracts has been made. These help to fix the shape, size and price of farms. Experts of the College of Agriculture

have rendered important aid in the early development of these settlements.⁸ The Board employs a superintendent to act as the friendly practical adviser of settlers and a farmstead engineer helps plan farm buildings and lay out the farms.

At Durham, about \$30,000 was expended in preparing farms for cultivation before they were turned over to settlers. A similar course has been followed at Delhi, where land was seeded to alfalfa and 130,000 rooted grape vines were planted before the farms were sold.

TERMS OF PAYMENT FOR LAND AND IMPROVEMENTS

(Taken from the Board's announcement of the opening of the first unit of Delhi.)

Five per cent of the cost of the land must be paid at the time of purchase and 40 per cent of the cost of the improvements. Payment of the remainder of the purchase price of land can, if desired, be made in 73 semiannual payments extending over 36½ years with interest at the rate of 5 per cent per annum, payments of principal and interest to be made semi-annually. These payments will be amortized in accordance with a table approved by the Federal Farm Loan Board. If settlers desire they can make a larger initial payment or they can pay off any number of installments of the principal at any installment date after five years from the first payment. Payments on improvements may extend over a period of 20 years.

The settler, on making the initial payment, is given a contract of purchase which sets forth the conditions of payment and the obligations a settler assumes. He is given a deed to the land when payments are completed and all other conditions of the purchase contract have been fulfilled.

Section 11 of the act provides that the Board may at any time prior to the end of the fifth year after the commencement of the settler's purchase contract extend the following aid:

(a) Prepare all or any part of such land for irrigation and cultivation.

(b) Seed, plant, or fence such land, and cause dwelling houses and outbuildings to be erected on any farm allotment or make any other

⁸ The following officials assisted in working out the plans for Durham and for carrying the State Land Settlement Act into effect: University of California, Professors Chas. F. Shaw (Division of Soil Technology), W. B. Herms (Professor of Parasitology), Gordon H. True (Division of Animal Husbandry), Frank Adams (Irrigation Investigations); U. S. Department of Agriculture, Mr. Milo B. Williams; State Engineering Department, Mr. W. E. Backus; State Board of Control, Mr. W. B. Draper and S. Gundelfinger, accounts; Mr. Frank English, Deputy Attorney General of the State of California.

improvements not specified above necessary to render the allotment habitable and productive in advance of or after settlement, the total cost to the Board of such dwellings, outbuildings, and improvements not to exceed one thousand five hundred (\$1500) dollars on any one farm allotment.

(c) Cause cottages to be erected on any farm laborer's allotment and provide a domestic water supply, the combined cost to the board of the cottage and water supply not to exceed eight hundred (\$800) dollars on any one farm laborer's allotment.

(d) Make loans to approved settlers on the security of permanent improvements, stock and farm implements, such loans to be secured by mortgage or mortgages, deed or deeds of trust on such permanent improvements, stock or farm implements, and the total amount of any such loan, together with money spent by the Board on improvements as above specified, not to exceed three thousand (\$3000) dollars on any one farm allotment, or two thousand (\$2000) dollars on any one farm laborer's allotment.

Conditions Governing Settlement.—The purpose of the State Land Settlement Act is given in section 2. It is "To provide employment and rural homes for soldiers, sailors, marines and others who have served with the armed forces of the United States in the European War or other wars of the United States, including former American citizens who served in allied armies against the central powers and have been repatriated, and who have been honorably discharged, to promote closer agricultural settlement, to assist deserving and qualified persons to acquire small improved farms, to demonstrate the value of adequate capital and organized direction in subdividing and preparing agricultural land for settlement, and to provide homes for farm laborers."

In accordance with the above, ex-service men who, in the opinion of the Board, are qualified to succeed, will be given preference over civilian applicants.

Where settlers have enough money to make needed improvements they will be expected to do this. Improvements to enable farms to be brought into full production in the shortest possible time will, where necessary, be made by the Board. The superintendent will give beginners practical advice and direction regarding farm operations and aid in the organization of coöperative organizations.

Community Coöperation Association.—The benefits of coöperation have been so strikingly shown at Durham, that every settler will be

required in his purchase contract to become a member of a community coöperative association and conform to the constitution and by-laws. Copies of these may be had at the Board's offices. Aid will be given in extending coöperation in other directions to meet all the settlement's needs.

Qualification of Settlers—Minimum Capital.—Each settler should have such practical knowledge, industry, and character as to utilize fully the advantages of soil, climate, and liberal financial terms of the settlement.

No applicant shall be approved who shall not satisfy the Board as to his or her fitness successfully to cultivate and develop the allotment applied for. In the selection of settlers these qualifications will be given great weight. The settler must have enough money to pay 5 per cent of the cost of the land. He should also have enough money to buy a working equipment of tools and livestock. What this minimum capital should be depends in some measure on the acreage of land taken and the kind of agriculture the settler intends to follow. The State Land Settlement Board does not believe that any one should attempt to buy one of these farm allotments who has less than \$1500 capital, or a working equipment of implements and livestock which is the equivalent of such capital.

There is no maximum limit on the money a settler may have, but a settler must not be the holder of agricultural land elsewhere, or of possessory rights thereto, to the value of \$15,000 and must not by this purchase become the holder of agricultural land or of possessory rights thereto exceeding such value of \$15,000.

Capital of Farm Workers.—The farm laborer can, however, safely undertake the purchase of a two to four acre farm laborer's allotment if he can make the initial payment. The semiannual payments will be less than the rent he would have to pay for a house in town. The industrious man can save enough out of his wages to meet these payments, hence he does not need a working capital. Farm laborers will, therefore, be accepted who are in a position to meet this initial payment.

GENERAL CONDITIONS REQUIRED BY THE LAND SETTLEMENT ACT

Land must be sold either as farm allotments, each of which shall have a value not exceeding, without improvements, fifteen thousand (\$15,000) dollars, or as farm laborers' allotments, each of which shall have a value not exceeding, without improvements, one thousand (\$1000) dollars.

Applicants must be citizens of the United States, or have declared their intention to become citizens.



Fig. 5.—Preparing land for irrigation at Delhi.

The State Land Settlement Board reserves the right to reject at its discretion any or all applications.

Settlers must be prepared to enter within six (6) months, upon actual occupation of the land acquired.

No more than one farm allotment or farm laborer's allotment shall be sold to any one person.

The repayment of loans which may be made by the Board to settlers on livestock or implements may extend over a period of five (5) years.

Every contract entered into between the Board and an approved purchaser shall contain, among other things, provisions that the purchaser shall cultivate the land in a manner to be approved by the Board and shall keep in good order and repair all buildings, fences

and other permanent improvements situated on his allotment, reasonable wear and tear and damage by fire excepted.

Each settler shall, if required, insure and keep insured against fire all buildings on his allotment, the policies therefor to be made out in favor of the Board, and to be such amount or amounts, and in such insurance companies as may be prescribed by the Board.

No allotment sold under the provisions of this act shall be transferred, assigned, mortgaged, or sublet in whole or in part, without the consent of the board given in writing, until the settler has paid for his farm allotment or farm laborer's allotment in full and complied with all of the terms and conditions of his contract of purchase.

In the event of a failure of the settler to comply with any of the terms of his contract of purchase and agreement with the Board, the state and the Board shall have the right at its option to cancel the said contract of purchase and agreement, and thereupon shall be released from all obligation in law or equity to convey the property, and the settler shall forfeit all right thereto, and all payments theretofore made shall be deemed to be rental paid for occupancy.

The failure of the Board or the State to exercise any option to cancel for any default shall not be deemed as a waiver of the right to exercise the option to cancel for any default thereafter on the settler's part.

No forfeiture occasioned by default on the part of the settler shall be deemed in any way, or to any extent, to impair the lien and security of the mortgage or trust instrument securing any loan that the Board may have made as in the Land Settlement Act provided.

The Board shall have the right and power to enter into a contract of purchase for the sale and disposition of any land forfeited, because of default on the part of a settler.

Actual residence on any allotment sold shall commence within six (6) months from the date of the approval of the application, and shall continue for at least eight (8) months in each calendar year for at least ten (10) years from the date of the approval of the said application, unless illness or some other cause satisfactory to the Board prevents; provided, that in case any farm allotment disposed of is resold by the state, the time of residence of the preceding purchaser may in the discretion of the Board be credited to the subsequent purchaser.

PROGRESS OF THE STATE SETTLEMENTS AND THEIR DISTINGUISHING FEATURES

Those who are looking for homes under the California Land Settlement Act can find them only at Delhi as all of the farms and farm laborers' homes now available at Durham have been sold. Some knowledge of the development at Durham will help people to understand what Delhi is likely to be.

DURHAM

Durham is interesting because it is old enough to have a distinctive character and can therefore be regarded as a concrete expression of the California Land Settlement Act. The settlement is in Butte County with Durham, a village of about 500 people, about half a mile away. Two railroads connect the settlement with the state capital and the state highway runs through Durham. Of the 6200 acres of land purchased, 360 acres have been leased for three years. About 700 acres is too high to be irrigated by gravity. Neither the leased lands nor the high pasture lands have been sold. The settlement therefore embraces about 5000 acres and on this 90 farmers, 26 farm laborers and their families now live.

The first step after the purchase of the land was to make it ready for settlement. To do this, a soil survey was made and a soil map prepared which showed the land that was best adapted to the growing of grain, fruit, alfalfa, and vegetables. This soil map was the foundation of the valuation of the different farms and farm laborers' allotments, and has proven of marked practical usefulness. Then a contour survey giving every change of elevation of six inches was made. It was the basis for laying out the irrigation ditches and for leveling the surface of the different farms so that water would flow over it evenly. Following the preparation of the soil and contour maps a subdivisional plan of the area was adopted and when the boundaries of the different tracts had been marked out and permanently witnessed by concrete posts the different farms were valued. It was necessary that the total sum received from the sale of the land should equal the amount paid for it, plus the amount that had been expended in building the irrigation system and the estimated amount of money needed to cover further expenses and possible losses.

All these expenses have to be provided for, as the enterprise must be self sustaining. The state gives nothing. In effect it loans the Board money at 4 per cent. The whole cost of land, roads, irrigation

system and estimated overhead worked out an average cost of \$173 an acre and the different farms had to be valued with a view to making them all equally attractive, the whole realizing this average price.

When valued there was a wide range in prices on the different farms, the lowest being \$75, the highest \$235 an acre. So well had the valuations been made that every farm was the first choice of some applicant. The average value of the farms is \$8800; the average value of the farm workers' allotment is \$400.

Before the land was thrown open to settlement it had been examined by the experts of the State Agricultural College, who advised the settlers to adopt a combination of dairying, stock raising and the growing of fodder crops, of which alfalfa is the most important. For this kind of agriculture, coöperation in buying and selling was important. If the 90 farmers had been left to buy the livestock needed on their farms without any organization or coöperation, they would have been bidding against each other at sales, often buying unfit animals at high prices. Instead of this, they formed a coöperative stock breeders' association. They adopted one breed of dairy cattle, the use of nothing but pure-bred sires, and elected a buying committee, which has purchased all the animals now on the settlement.

In this way they have secured better stock at far less money than would have been possible if each individual worked alone. The same principle of organized coöperation has run through the development of their farms. Instead of leaving each settler to look after the building of his house, the Board employed a farmstead engineer, who with competent assistance has bought the material needed for houses at wholesale for cash, made the plans and supervised their erection. This left the settlers free to go about the development and cultivation of their farms, increasing their first year's income by growing more crops, and they secured houses that are better built and far more attractive than is the usual rule in unorganized development.

The Superintendent of the Durham Settlement is a graduate of the Colorado Agricultural College. He had been for five years in Australia as the superintendent in the management of one of the closer settled irrigated areas in the State of Victoria, and had spent two years as farm adviser in one of the counties of California. His experience had prepared him, therefore, to understand the needs of settlers and made him a valuable advisor.

The capital of the farmers at Durham varied from \$1500 to \$15,000, the average being \$6700. The capital of farm laborers varied from \$20 to \$4700.

When the Board purchased the land in the spring of 1918 no one had lived on it but tenants or hired laborers for 20 years. Now there are about 120 families with more than 200 children, all living in comfortable houses, cultivating farms that are in most cases fully improved and on which there are many dairy herds of unusual excellence. It furnishes a striking contrast to the menace of the slum life of the cities, and should encourage those who believe in an enlarged use

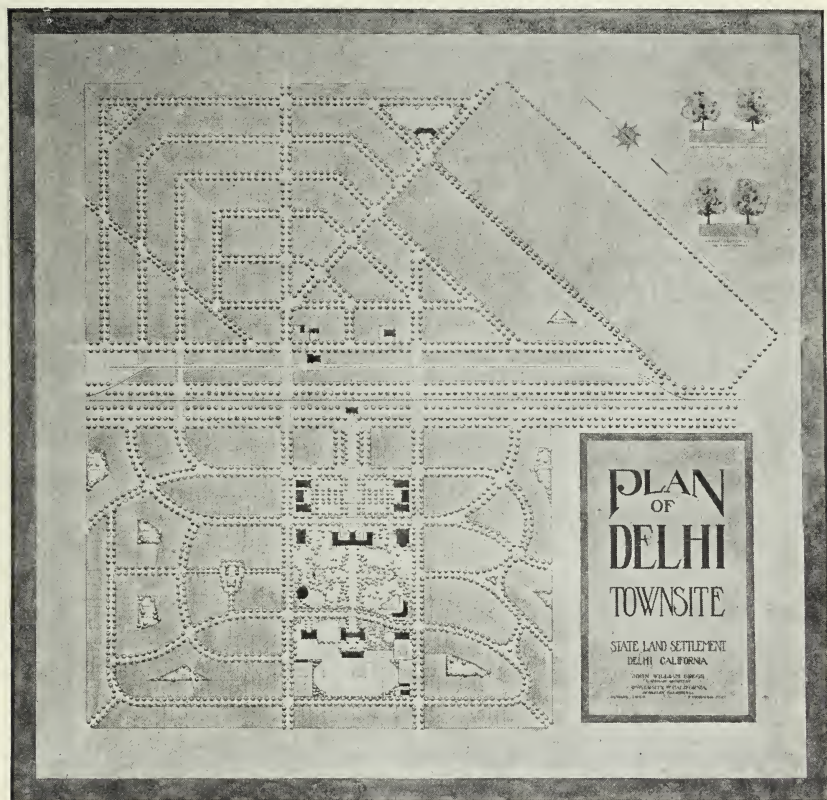


Fig. 6.—The Delhi townsite. It has the offices of the board and a large factory for making concrete pipe.

of the state as an instrument of direct service in those things that affect the general welfare.

The average income of settlers who have been on these farms for a year is over \$2000. They have met their payments to the state and they are in good condition to continue to do so. In 1919 a committee of the State Legislature, after investigating the colony, reported that it was a kind of development that the state could expand indefinitely. An appropriation of \$1,000,000 for immediate extensions

was made without opposition, and a bond issue of \$10,000,000 was authorized.⁹

The total indebtedness to the state of the settlers at Durham is about \$900,000 and the total arrears in June 30, 1920, was less than \$10,000 or about 1 per cent. The surplus of assets over liabilities as shown by the last audit of the state authorities is \$185,000. It is therefore, a solvent institution both for the settlers and for the state.

The Coöperative Stock Breeders' Association own seven registered Holstein bulls and several fine herds of pure bred stock have been started. A number of orchards have been planted and the indications are that dairying, market gardening and fruit growing will all have important places in the settlement.

DELHI

The Delhi Settlement is in Merced County in the well known Turlock Irrigation District. The 9,000 acres purchased will be offered to settlers in three units as fast as made ready for irrigation. The first unit was opened in May, 1920. The second will be opened in September, 1920. The report on this tract made to the Board by the Professor of Soil Technology of the State University gives the information most desired by intending settlers.

Location.—The main tract lies principally between the Southern Pacific and Santa Fe railroads and extends from about one mile west of Delhi townsite to about a mile east of Ballico. It is about seven miles southeast of Turlock in Merced County.

Acreage.—Its greatest length is about $4\frac{1}{2}$ miles with a width of about four miles in its widest part. It covers about $9\frac{1}{2}$ square miles or 8570 acres.

Elevation.—The tract has an average elevation of about 135 feet above sea level with local variations in its surface features of about 25 feet.

Surface Features.—The land has an undulating surface with minor local areas of dune-like topography. The entire surface is largely wind-formed and possesses minor elevations, ridges and depressions characteristic of wind-formed soils. The general slope of the land is from north to south and from east to west with an average gradient of about seven or eight feet to the mile.

Land.—Only one type of soil, a medium sand, is present. The soil on the ridge crests and other elevated parts is usually somewhat coarser than that at lower levels. The soil is uniform to six feet or more in depth except for a few small intermittent spots containing thin layers of rather compact silty material at depths ranging from three to six feet below the surface. Some scattered areas totalling less than 300 acres in extent are underlain by one or more layers of gray calcareous hardpan, while other areas, totalling about 200 acres, have a red "iron" hardpan at depths of from three to four feet.

⁹ This bond issue has recently been declared invalid because of a defect in the sinking fund provision.

The sand in the depressions and other lower lying positions is a little more loamy and locally approaches a fine sand in texture. In these places the compact silty subsoil layers are more numerous and usually nearer the surface but they do not hinder the penetration of roots and water. In fact they sometimes serve a beneficial purpose in checking the loss of water by percolation. The soil is loose and soft when dry and in the virgin state and tends to drift quite badly over exposed surfaces but when sown to crops and irrigated the surface packs quite firmly and is not affected by wind to any great extent. It is low in organic matter, absorbs water readily and is very easily tilled at all times of the year.

No alkali is present in this tract but the water table is high in part of the area west of the Southern Pacific Railroad. Excessive use of water on the same kind of soil nearby has caused a rising of the watertable in some of the depressions and an accumulation of small amounts of alkali.

The tract as a whole is very well drained and the soil retains moisture well.

Irrigation.—Units 1 and 2 of the Delhi Settlement are in the Turlock Irrigation District, a coöperative organization of water users. Gravity water is taken from the Tuolumne River by the district canals. This, in some instances, will be supplemented by water pumped from wells. In order to lessen the loss of water in distribution and furnish a better supply for the farms, part of the irrigation water will be delivered through concrete pipe lines. As these pipe lines can deliver water to different elevations, it will render it unnecessary to grade down some of the rolling country or to build high fills for ditches. The cost of pipe lines or ditches to deliver water to every farm is included in the selling price of the land. The annual charge for water from the district will include an assessment on the value of the land made by the district which, in 1919, amounted approximately to \$1.40 an acre and whatever additional charge is needed to maintain the local pipe lines and distributing works.

The state has built a concrete pipe factory at Delhi which will furnish pipe to the farmer at cost, when he desires to use pipe instead of earthen ditches for his farm laterals.

The cost of levelling land for irrigation on the Delhi Colony varies with the surface irregularities, ranging from \$30 to \$50 per acre for alfalfa and \$10 to \$30 per acre for orchard or vines. Narrow border irrigation has been found to be the most adaptable for alfalfa and basin and furrow irrigation for orchards and cultivated crops.

Climate.—The climate of the region is healthful and is characteristic of that of the best drained parts of the San Joaquin Valley. The rainfall is about 10 inches.

Utilization.—Most of the land in the tract is still in the virgin state. That in use is utilized without irrigation for rye, wheat, barley and milo with low yields.

Under irrigation from wells from seven to nine tons of alfalfa were produced per acre in six cuttings in part of Sec. 1 near Ballico. Here excellent pumpkins, sweet and Irish potatoes, melons, peaches, grapes, milo and other crops are produced. A well is located on a sand ridge in this section which supplies about 80 to 100 inches of water with a lift of 50 feet and an apparent inexhaustible supply of water.

There are no nearby lands suitable for grazing purposes.

The land is capable of intensive agriculture and well suited for subdivision purposes. The roads are very heavy with sand but these can be greatly improved

without serious difficulty. The state highway cuts through the western part of the settlement lands and the county has considered the plan of improving the road along the Santa Fe Railroad on the east.

Water, and suitable types of farming, are the most important factors for success with crops on this tract.

Transportation is excellent.

The Superintendent at Delhi is a graduate of the Iowa Agricultural College and was formerly in charge of the State Experiment Station in the Imperial Valley and later Assistant State Leader of Farm Advisors of California.

One hundred and sixty acres were planted to vines and 80 acres seeded to alfalfa before the first unit at Delhi was opened. The vines have done well when not injured by rabbits. The alfalfa was damaged by the winds due to the earliness of planting. Windbreaks are needed in order to check the cutting effect of the wind-carried sand. Eucalyptus trees have been planted around the town of Delhi and along one of the highways.

Delhi ought to start with dairying and trucking and grow into a vine and orchard district. A few years of alfalfa and cows will put the soil in condition to push fruit trees and vines into bearing faster than if planted in the virgin soil.

DELHI TOWNSITE

Professor J. W. Gregg, Professor of Landscape Gardening at the University, prepared the plan at Delhi townsite. Its curved streets and slightly location on high land bordering the Southern Pacific Railway and the state highway will make it a pleasant town to live in and it has enough tributary country to make it a good business center.

THE CAPITAL A SETTLER SHOULD HAVE

Nothing connected with the operation of this act has been more discussed than the Board's requirement that an applicant for a farm should have at least \$1500 to be accepted. Men accustomed to free homesteads said, "Why not take men without any money?" The Board took this action because a settler had to have money to make the first small payment. He had to have money to live on while growing a crop and part of the money needed to buy equipment and develop the land's earning power. The minimum fixed was regarded as the least sum with which a very industrious and saving family could



Fig. 7.—Block 10, Durham.

squeeze through. After two years' experience, that sum is regarded as too small. An applicant for a farm should now have more money because the cost of everything which has to be bought has about doubled.

A rough estimate of the outlay which a settler on a 40 acre farm, costing with water right \$250 an acre, or \$10,000, will have to incur the first year has been prepared. It will help intending settlers decide how much money they ought to have, to undertake buying a farm at Delhi.

In this estimate the settler borrows \$2520 from the Board. This is as much as the Board ought to lend any settler the first year. Some margin of the \$3000 credit which can be extended ought to be held in reserve for later emergencies.

MINIMUM FIRST YEAR EXPENSES OF SETTLER BUYING
A 40 ACRE FARM COSTING \$10,000

Item	Cost	Settler's Payment	State Advance
40 acres at \$250.....	\$10,000	\$500	\$9,500
Semi annual land payment.....	.....	285	.....
House.....	1,500	600	900
Farm buildings.....	600	240	360
Team.....	300	120	180
Cows, pigs and chickens.....	1,000	400	600
Farm implements.....	750	750	.....
Furniture.....	.....	300	.....
Levelling and alfalfa (15 acres).....	800	320	480
Planting and cultivating 20 acres.....	400	400	.....
Ditches—Laterals.....	400	400	.....
Living Expenses.....	500	500	.....
		4,815	\$2,520*

This leaves the settler a credit margin of \$480. The Board can advance this farther amount if the settler's industry or need warrants doing so.

Practical farmers looking over the above list would vary the cost of different items and add to or subtract from the things needed. It is the opinion of the superintendents of Durham and Delhi, who have examined and approved the costs in this table, that the total is below rather than above the average outlay. It does not include taxes, water charges or doctors' bills.

RETAIL COST OF SOME OF THE ARTICLES NEEDED IN
EQUIPPING A FARM

The prices of farm and household articles needed by settlers were obtained from the merchants at Turlock, the nearest large town to Delhi.

Article	Cost
Driven well and pump for household.....	\$50.00 to \$75.00
9 x 12 hog house.....	50.00 to 125.00
Lumber for outbuildings and corral, per thousand.....	45.00 to 50.00
Fence posts, per hundred.....	35.00
Barb wire, per roll.....80 rod spool.....	7.10
per hundred lbs.....	8.90

* In addition to the advance on land.

Article	Cost
Woven wire, two feet wide—	
Union lock 24 in. high 6 in. space, per roll.....	9.20
Union lock 26 in. high 6 in. space, roll of 20 rods.....	10.70
Chicken wire 24 in. high, per roll of 150 ft.....	3.55
Silo, \$2.50 to \$5.00 per ton capacity.....	250.00 to 600.00
Team of horses.....	300.00
Set of harness.....	50.00 to 60.00
Dairy cow.....	75.00 to 200.00
Brood sows.....	50.00 to 200.00
pure bred.....	30.00
grade.....	30.00
Fowl, per dozen.....	15.00
12 inch walking plow.....	25.50
Wood beam.....	35.20
Steel beam.....	35.20
9 foot spike tooth harrow.....	32.40
New Ajax 5-8 in. teeth	36.50
50 tooth.....	85.00 to 90.00
60 tooth.....	12.00
Walking cultivator.....	75.00 to 80.00
2 horse.....	32.00
Hand cultivator.....	.60 to 2.50
Corn and bean planter.....	6.50
Fresno Scraper.....	15.00
Pruning saw.....	107.50
Hand spray outfit.....	75.00
Bucket spray.....	25.00 to 40.00
Knapsack spray.....	150.00 to 235.00
5 foot mower.....	2.00
10 foot rake.....	2.25
Hay rack.....	1.85 to 2.75
2 ton wagon.....	1.20
Pitchforks.....	2.10
4 in. tire.....	2.90
3 tine 5 ft. handle.....	3.00
4 tine 5 ft. handle.....	18.00
Shovels.....	18.65
Long handle.....	22.65
Hoes.....	15.00 to 25.00
6 to 8 in. ....	.60
Spade.....	.70
Post auger.....	.75
6 in. ....	.85
7 in. Irvan	1.05
Jackson hay fork.....	2.00
4 ft.	
4½ ft.	
5 ft.	
Feeding trough.....	
Feed buckets.....	
8 qt. gal. iron.....	
10 qt. gal. iron.....	
12 qt. gal. iron.....	
14 qt. gal. iron.....	
16 qt. gal. iron.....	
2 trees.....	

House Furnishings

Cook stove (wood).....	Steel range, 6 hole.....	60.00 to 250.00
	Cast iron range, 6 hole	35.00
	Cast iron range, 4 hole	20.00
	Steel range 6 hole, drop door.....	250.00

Article	Cost
Cook stove (kerosene).....3 burner coal oil, quick meal.....	28.80
Double burner, oven.....	5.50 to 11.00
Glass door.....	7.00
Table.....42 in. to 60 in., 6 ft. extension.....	24.00 to 115.00
Kitchen chairs.....	2.25
Bedstead (double) (iron or brass).....	10.50 to 34.00
Spring.....	7.50 to 28.00
Mattress.....	12.50 to 45.00
Cooking utensils (family of five) for necessities—not aluminum	15.00 to 20.00
Kitchen table.....42 in. x 48 in.....	6.50 to 17.50
Linoleum.....per sq. yd.....	1.10
per yd.....	1.75
Inlaid.....	2.35 to 2.75
Kitchen cabinet.....	40.00 to 73.00
Carpet.....8 x 10 ft. grass rug.....	12.50
Wool and fibre.....	25.00 to 35.00
Tapestry Brussels.....	49.50
Hammer and hatchet.....	.50 1.25

It will cost less to equip a 20 acre farm and the payments will be less, but the first year's outlay will not be halved. It seems therefore that a farmer ought to have from \$3000 to \$5000 before he tries to buy a farm under the generous terms of this act.

MONEY A FARM LABORER SHOULD HAVE

Farm laborers need only the land and a house to live in. The money to meet payments comes from wages, hence, the only capital needed is the money to make the first payment. This payment on the land may vary from \$20 to \$50. If he builds a house with the Board's help, the first payment will be 40 per cent of the cost. On a \$1000 house, this will be \$400. On a house costing \$1500 it will be \$600. A farm laborer should, therefore, have somewhere between \$20 and \$1000. The Board has no requirement. The capital of farm laborers at Durham varied from \$20 to \$4700. Those in the first unit at Delhi varied from \$20 to \$2800.

FARMS FOR EX-SERVICE MEN

One of the duties of the nation, which ought not be neglected, is to provide for the restoration to health of sick and injured ex-service men of the Great War. Some of these must have life in the open. Some want to become farmers. Some who want to take up farm life lack experience. California needs a carefully thought out plan for doing, worthily and without waste, whatever is needed to train and restore these men to efficient life on farms.

When the first unit at Delhi was thrown open, about two thirds of the applicants were ex-service men and nearly all the farms went to these applicants. What has happened since then helps to show the course that should be adopted in the future. The ex-service men who are well, who know how to farm, are going ahead and will find this act a great help to success. But some who were given farms were suffering from injuries or disease; some lack practical knowledge and skill. They find it hard to get started and it is hard at Delhi because it is not easy to get crops started on its sandy soil. Some of the ex-



Fig. 8.—Farm home, Durham.

service men who are not practical farmers came to the settlement because they looked on this chance to buy a farm as a reward for services and sacrifices in the war. When they came to realize how much money is needed to convert raw land into productive farms, how many risks there are between seeding a field and harvesting a crop, and how hard a farmer and his wife have to work to succeed, a number of applicants of small experience decided not to go on. In every instance this was the right course to follow. The opportunities of this act, generous as they are, will not enable men who lack both capital and experience to succeed.

Rural life today faces this condition. The man who owns a farm and is out of debt is better off than ever before in the country's

history because he can get higher prices for crops or higher rent for land. But the man who has to go in debt for a farm and for part of its equipment has a struggle ahead of him longer and harder than that of the farm buyer of the past. Nicholson well says, "Farming is not an affair of romance, poetry, or pictures but a business exacting and difficult." The brief experience with soldier settlement at Delhi shows that sick and injured ex-service men need more help and a different kind of help to that which can be given under any Land Settlement Act framed to help landless men own farms without cost to the state.

This act appeals only to those who love farming as a mode of life and who are willing to struggle and save to enjoy landed independence. It helps men fitted to farm and who want to farm to become farm owners. The need for this help is so great and the benefits reach so many worthy people that the policy of the act should not be changed. It has value to ex-service men who would rather farm than do anything else. This leaves uncared for a large class of deserving ex-service men who must go to the country to be restored to health and strength. Many of these must take up farm work because life indoors is not possible. But to meet their needs, something entirely different from the Land Settlement Act must be provided. Men who are sick ought not to be subjected to the anxiety and strain of meeting payments on land or doing the heavy work that must be done in developing a farm. Something like the practical farm schools of Denmark is needed. In these schools the land is divided up into farms of the size that men need to own. There would be gardens of 5 and 10 acres and farms of 20 and 40 acres and these farms would be working examples of good farm practice. They could be leased to ex-service men or they could be hired to cultivate them under competent direction. There should be a central farm with a mess hall and sleeping quarters and physicians and nurses so that the training of men who need it and the health of the sick could all be properly looked after. Ex-service men suffering from shell shock, tuberculosis, or wounds can get out of this life what they would fail to get on farms at Durham or Delhi. In two or three years, many of them would be able either to undertake to buy farms of their own or have their health so restored that they can take up other kinds of employment.

This feature of soldier settlement ought to be handled by a board entirely apart from the Land Settlement Board. In other words, this state needs two settlement agencies, each one doing a definite work rather than attempting to have one makeshift for securing two entirely different ends.

STATION PUBLICATIONS AVAILABLE FOR FREE DISTRIBUTION

BULLETINS

- | | |
|--|---|
| <p>No.</p> <p>168. Observations on Some Vine Diseases in Sonoma County.</p> <p>169. Tolerance of the Sugar Beet for Alkali.</p> <p>185. Report of Progress in Cereal Investigations.</p> <p>208. The Late Blight of Celery.</p> <p>250. The Loquat.</p> <p>251. Utilization of the Nitrogen and Organic Matter in Septic and Imhoff Tank Sludges.</p> <p>252. Deterioration of Lumber.</p> <p>253. Irrigation and Soil Conditions in the Sierra Nevada Foothills, California.</p> <p>257. New Dosage Tables.</p> <p>261. Melaxuma of the Walnut, "Juglans regia."</p> <p>262. Citrus Diseases of Florida and Cuba Compared with Those of California.</p> <p>263. Size Grades for Ripe Olives.</p> <p>266. A Spotting of Citrus Fruits Due to the Action of Oil Liberated from the Rind.</p> <p>267. Experiments with Stocks for Citrus.</p> <p>268. Growing and Grafting Olive Seedlings.</p> <p>270. A Comparison of Annual Cropping, Biennial Cropping, and Green Manures on the Yield of Wheat.</p> <p>271. Feeding Dairy Calves in California.</p> <p>272. Commercial Fertilizers.</p> <p>273. Preliminary Report on Kearney Vineyard Experimental Drain.</p> <p>274. The Common Honey Bee as an Agent in Prune Pollination.</p> <p>275. The Cultivation of Belladonna in California.</p> <p>276. The Pomegranate.</p> <p>277. Sudan Grass.</p> <p>278. Grain Sorghums.</p> <p>279. Irrigation of Rice in California.</p> <p>280. Irrigation of Alfalfa in the Sacramento Valley.</p> <p>282. Trials with California Silage Crops for Dairy Cows.</p> <p>283. The Olive Insects of California.</p> | <p>No.</p> <p>285. The Milch Goat in California.</p> <p>286. Commercial Fertilizers.</p> <p>288. Potash from Tule and the Fertilizer Value of Certain Marsh Plants.</p> <p>290. The June Drop of Washington Navel Oranges.</p> <p>297. The Almond in California.</p> <p>298. Seedless Raisin Grapes.</p> <p>299. The Use of Lumber on California Farms.</p> <p>300. Commercial Fertilizers.</p> <p>301. California State Dairy Cow Competition, 1916-18.</p> <p>302. Control of Ground Squirrels by the Fumigation Method.</p> <p>303. Grape Syrup.</p> <p>304. A Study on the Effects of Freezes on Citrus in California.</p> <p>308. I. Fumigation with Liquid Hydrocyanic Acid. II. Physical and Chemical Properties of Liquid Hydrocyanic Acid.</p> <p>309. I. The Carob in California. II. Nutritive Value of the Carob Bean.</p> <p>310. Plum Pollination.</p> <p>311. Investigations with Milking Machines.</p> <p>312. Mariout Barley.</p> <p>313. Pruning Young Deciduous Fruit Trees.</p> <p>314. Cow-Testing Associations in California.</p> <p>316. The Kaki or Oriental Persimmon.</p> <p>317. Selections of Stocks in Citrus Propagation.</p> <p>318. The Effects of Alkali on Citrus Trees.</p> <p>319. Caprifigs and Caprification.</p> <p>320. Control of the Coyote in California.</p> <p>321. Commercial Production of Grape Syrup.</p> <p>322. The Evaporation of Grapes.</p> <p>323. Heavy vs. Light Grain Feeding for Dairy Cows.</p> <p>324. Storage of Perishable Fruit at Freezing Temperatures.</p> <p>325. Rice Irrigation Measurements and Experiments in Sacramento Valley, 1914-1919.</p> |
|--|---|

CIRCULARS

- | | |
|--|--|
| <p>No.</p> <p>65. The California Insecticide Law.</p> <p>70. Observations on the Status of Corn Growing in California.</p> <p>76. Hot Room Callusing.</p> <p>82. The Common Ground Squirrels of California.</p> <p>87. Alfalfa.</p> <p>109. Community or Local Extension Work by the High School Agricultural Department.</p> <p>111. The use of Lime and Gypsum on California Soils.</p> <p>113. Correspondence Courses in Agriculture.</p> <p>114. Increasing the Duty of Water.</p> <p>115. Grafting Vinifera Vineyards.</p> <p>117. The Selection and Cost of a Small Pumping Plant.</p> <p>124. Alfalfa Silage for Fattening Steers.</p> <p>126. Spraying for the Grape Leaf Hopper.</p> <p>127. House Fumigation.</p> <p>128. Insecticide Formulas.</p> <p>129. The Control of Citrus Insects.</p> <p>130. Cabbage Growing in California.</p> <p>131. Spraying for Control of Walnut Aphis.</p> <p>133. County Farm Adviser.</p> <p>135. Official Tests of Dairy Cows.</p> <p>136. Melilotus Indica.</p> <p>137. Wood Decay in Orchard Trees.</p> <p>138. The Silo in California Agriculture.</p> <p>139. The Generation of Hydrocyanic Acid Gas in Fumigation by Portable Machines.</p> | <p>No.</p> <p>140. The Practical Application of Improved Methods of Fermentation in California Wineries during 1913 and 1914.</p> <p>143. Control of Grasshoppers in Imperial Valley.</p> <p>144. Oidium or Powdery Mildew of the Vine.</p> <p>147. Tomato Growing in California.</p> <p>148. "Lungworms".</p> <p>152. Some Observations on the Bulk Handling of Grain in California.</p> <p>153. Announcement of the California State Dairy Cow Competition, 1916-18.</p> <p>154. Irrigation Practice in Growing Small Fruits in California.</p> <p>155. Bovine Tuberculosis.</p> <p>156. How to Operate an Incubator.</p> <p>157. Control of the Pear Scab.</p> <p>158. Home and Farm Canning.</p> <p>159. Agriculture in the Imperial Valley.</p> <p>160. Lettuce Growing in California.</p> <p>164. Small Fruit Culture in California.</p> <p>165. Fundamentals of Sugar Beet Culture under California Conditions.</p> <p>167. Feeding Stuffs of Minor Importance.</p> <p>168. Spraying for the Control of Wild Morning-Glory within the Fog Belt.</p> <p>169. The 1918 Grain Crop.</p> <p>170. Fertilizing California Soils for the 1918 Crop.</p> <p>172. Wheat Culture.</p> <p>173. The Construction of the Wood-Hoop Silo.</p> |
|--|--|

CIRCULARS—Continued

No.

174. Farm Drainage Methods.
175. Progress Report on the Marketing and Distribution of Milk.
176. Hog Cholera Prevention and the Serum Treatment.
177. Grain Sorghums.
178. The Packing of Apples in California.
179. Factors of Importance in Producing Milk of Low Bacterial Count.
181. Control of the California Ground Squirrel.
182. Extending the Area of Irrigated Wheat in California for 1918.
183. Infectious Abortion in Cows.
184. A Flock of Sheep on the Farm.
185. Beekeeping for the Fruit-grower and Small Rancher or Amateur.
187. Utilizing the Sorghums.
188. Lambing Sheds.
189. Winter Forage Crops.
190. Agriculture Clubs in California.
191. Pruning the Seedless Grapes.
193. A Study of Farm Labor in California.
195. Revised Compatibility Chart of Insecticides and Fungicides.
197. Suggestions for Increasing Egg Production in a Time of High-Feed Prices.

No.

198. Syrup from Sweet Sorghum.
201. Helpful Hints to Hog Raisers.
202. County Organization for Rural Fire Control.
203. Peat as a Manure Substitute.
204. Handbook of Plant Diseases and Pest Control.
205. Blackleg.
206. Jack Cheese.
207. Neufchatel Cheese.
208. Summary of the Annual Reports of the Farm Advisors of California.
210. Suggestions to the Settler in California.
213. Evaporators for Prune Drying.
214. Seed Treatment for the Prevention of Cereal Smuts.
215. Feeding Dairy Cows in California.
216. Winter Injury or Die-Back of the Walnut.
217. Methods for Marketing Vegetables in California.
218. Advanced Registry Testing of Dairy Cows.
219. The Present Status of Alkali.
220. Unfermented Fruit Juices.
221. How California is Helping People Own Farms and Rural Homes.